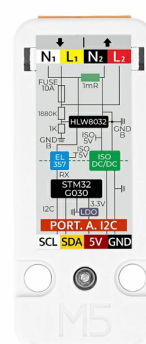


Unit AC Measure

SKU:U164



Description

Unit AC Measure is an isolated single-phase AC measurement unit based on an **STM32 + HLW8032** solution, capable of real-time high-accuracy monitoring of current, voltage and power data. It integrates the AC isolation converter B0505ST16-W5 and communicates with the STM32 via the EL357 optocoupler. Users can obtain measurement data through the I2C interface. This product is ideal for power information collection, remote smart appliances and similar applications.

Note

Input Voltage

Operating measurement range: must be AC 100 ~ 240V@10A, otherwise the device will not work properly.

Features

- STM32G030 @ Cortex-M0+ 32-bit MCU, 64 KB Flash, 8 KB RAM
- Single-phase AC 100 ~ 240V / 10A measurement
- I2C communication (0x42)
- Development Platform: UIFlow, Arduino

Includes

- 1 x Unit AC Measure
- 1 x HY2.0-4P Grove Cable (20cm)
- 1 x HT3.96-4P Terminal

Applications

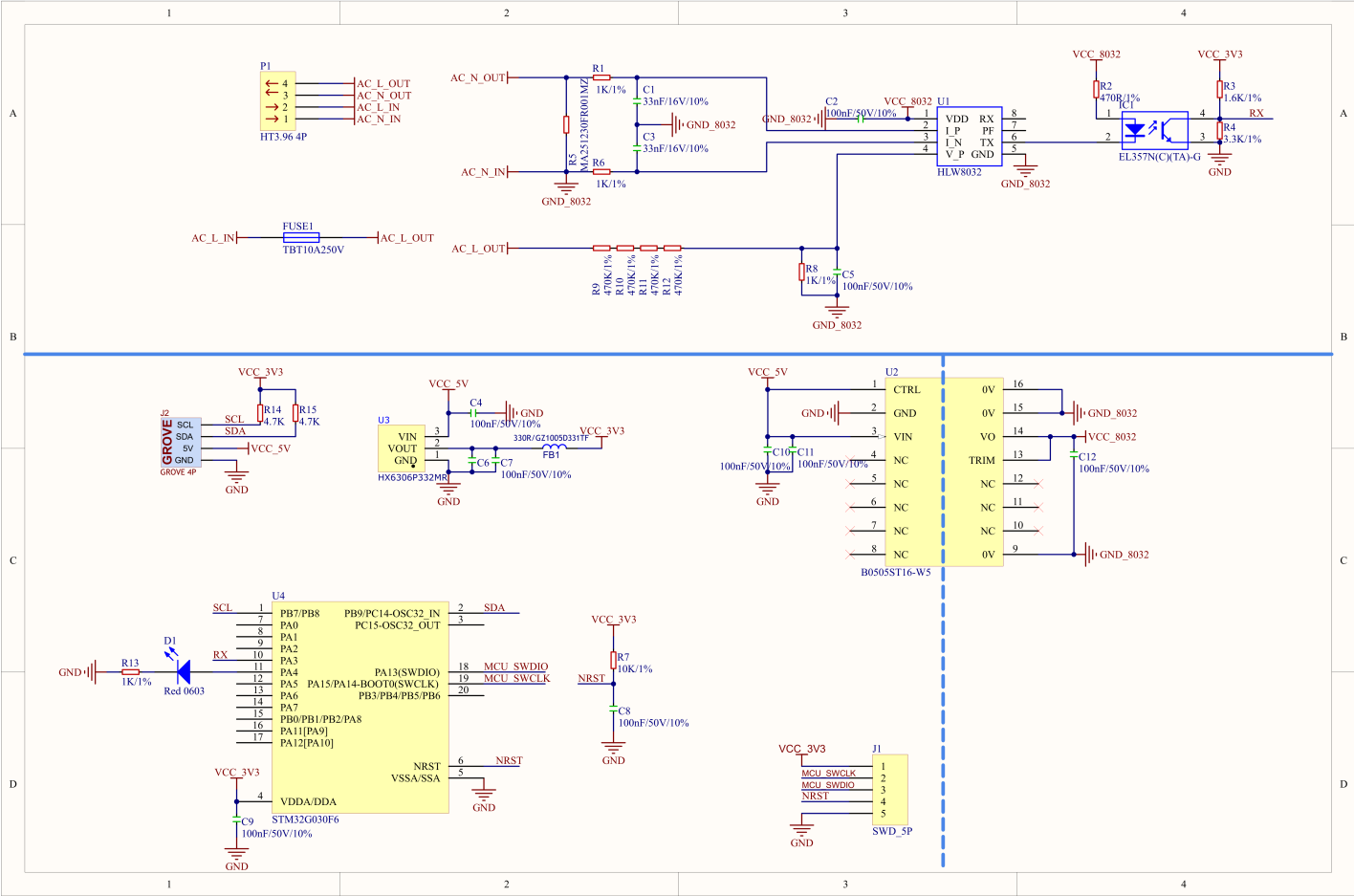
- Smart home appliances
- Metered socket
- Smart Wi-Fi socket
- EV charging pile
- Streetlight control system

Specifications

Specification	Parameter
MCU	STM32G030F6P6
AC Acquisition Chip	HLW8032
Isolation Chip	B0505ST16-W5
Optocoupler Communication Chip	EL357NB
Communication Interface	I2C @0x42
Measured Voltage/Current	AC 100 ~ 240V@10A
Product Size	56.0 x 24.0 x 10.3mm
Product Weight	8.4g
Package Size	138.0 x 93.0 x 11.3mm
Gross Weight	16.9g

Schematics

- [Unit AC Measure Schematics PDF](#)



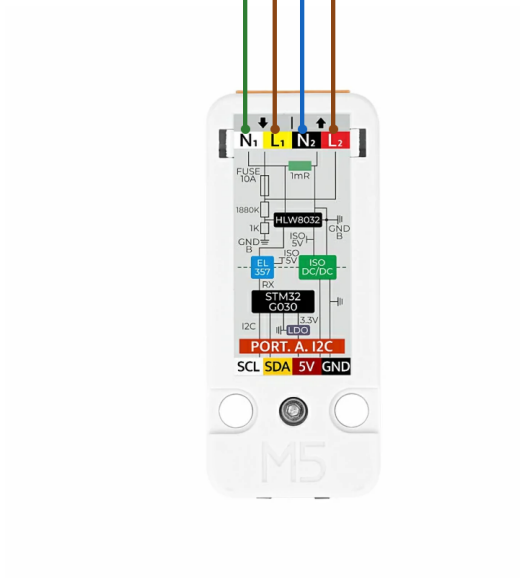
PinMap

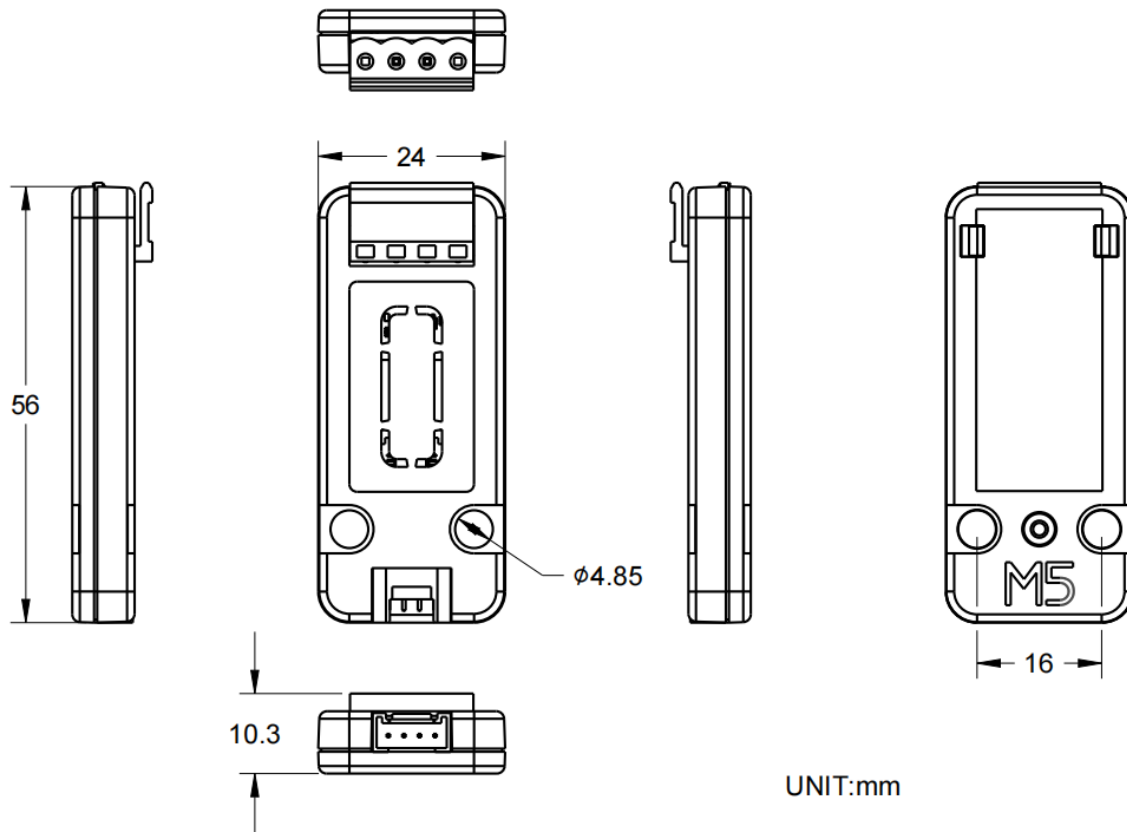
Unit AC Measure

HY2.0-4P	Black	Red	Yellow	White
PORT.A	GND	5V	SDA	SCL

AC Power Terminal Wiring

HT3.96-4P	L1	N1	L2	N2
Terminal	Line (L)	Ground (PE)	Line (L)	Neutral (N)





Structure

- [Unit AC Measure Structure Files](#)

Datasheets

- [B0505ST16-W5](#)
- [EL357NB](#)
- [HLW8032](#)
- [STM32G030](#)
- [I2C Protocol](#)

Softwares

Arduino

- [Unit AC Measure Driver Library](#)

UiFlow1

- [Unit AC Measure UiFlow1 Docs](#)
- [Unit AC Measure UiFlow1 Demo](#)

UiFlow2

- Unit AC Measure UiFlow2 Docs

Home Assistant

- Unit AC Measure Home Assistant Integration

Internal Firmware

- Unit AC Measure Internal Firmware

Protocol

- Unit AC Measure I2C Protocol

M5Stack Unit AC Measure I2C Protocol																	V1 (FW Version)	
REG MAP (Addr:0x42)																	2023/3/24	
																	note	
String	Voltage(V)	0x00 R	thousand's digit	hundred's digit	ten's digit	unit's digit	-	tenths	hundredths									
	Current(A)	0x10 R	thousand's digit	hundred's digit	ten's digit	unit's digit	-	tenths	hundredths									
	Active Power(W)	0x20 R	thousand's digit	hundred's digit	ten's digit	unit's digit	-	tenths	hundredths									
	Apparent Power(VA)	0x30 R	thousand's digit	hundred's digit	ten's digit	unit's digit	-	tenths	hundredths									
	Power Factor	0x40 R	unit's digit	-	tenths	hundredths												
	kW.h	0x50 R	ten millions	millions	hundred thousand's digit	ten thousand's digit	thousand's digit	hundred's digit	ten's digit	unit's digit	-	tenths	hundredths					
Value	Voltage(V)	0x60 R	voltage-L	voltage-H														Voltage: Voltage = (voltage-L + voltage-H * 256) / 100 ^[1]
	Current(A)	0x70 R	current-L	current-H														Current: Current = (Current-L + Current-H * 256) / 100
	Active Power(W)	0x80 R	active power-byte0	active power-byte1	active power-byte2	active power-byte3												Active Power: ActivePower = (ActivePower-L + ActivePower-H * 256) / 100
	Apparent Power(VA)	0x90 R	apparent power-byte0	apparent power-byte1	apparent power-byte2	apparent power-byte3												Apparent Power: ApparentPower = (ApparentPower-L + ApparentPower-H * 256) / 100
	Power Factor	0xA0 R	power factor															Power Factor: power factor / 100
	kW.h	0xB0 R	kW.h-byte0	kW.h-byte1	kW.h-byte2	kW.h-byte3												kW.h: kW.h = (kW.h-byte0 + kW.h-byte1 * 256 + kW.h-byte2 * 65536 + kW.h-byte3 * 16777216) / 100
	Voltage Coefficient	0xC0 R/W	voltage coefficient															Voltage Coefficient: voltage coefficient / 100
	Current Coefficient	0xD0 R/W	current coefficient															Current Coefficient: current coefficient / 100
	Save Coefficient	0xE0 W	save															Save: set a value > 1, will save voltage and current coefficient
	Data Ready	0xF0 R													Data Ready			Data Ready: Data Ready=1, data ready; Data Ready = 0, data not ready
	Firmware Version	0xF0 R														Version		Version: firmware version number
	I2C Address	0xF0 R/W														Address		Address: I2C Address

^[1] For example, the actual voltage is 100.55V, and the obtained data is 100.55*100=10055. Temperature-L = 0x47, Temperature-H = 0x27

Easyloader

Easyloader	Download	Note
Unit AC Measure Easyloader	download	/